MOTOROLA

Mobile Workstation 520™

Model F5205

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Commercial, Government and Industrial Solutions Sector

Vehicle Installation Guide

68P02962C15-O

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H) Freight costs to the repair depot.
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FCC INTERFERENCE WARNING

The FCC requires that manuals pertaining to Class A and Class B computing devices must contain warnings about possible interference with local residential radio and TV reception. This warning reads as follows:
NOTE: This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial or residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

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You may need to refer to the documents listed below for further information. These documents can be obtained from the following source:

Motorola Americas Parts Division Motorola Centralized Customer Service 1313 E. Algonquin Road Schaumburg, IL 60196 1-800-422-4210 FAX 1-847-538-8198	Motorola Literature Distribution Center 2290 Hammond Drive Schaumburg, IL 60172 1-847-576-2828 FAX 1-800-576-5891

MW-520

Document	Equip. Model No.	Document No.
Mobile Workstation 520™ Owner's Manual	F5205	68P02962C10-O
Mobile Workstation 520™ Quick Reference Card	F5205	68P02962C11-O
Mobile Workstation 520™ Application Developer's Guide	F5203	98-08901C31-O
FORTÉ RF Power Amplifier 800 MHz, 35W Owner & Installation Manual	FLN2424	68-02949C50

Using this Manual

Who Should Use this Manual

This manual is intended for trained service technicians, radio engineers, and technical operation support staff who install the Mobile Workstation 520™ (MW-520) in a vehicle.

What is in this Manual

“Introduction”, lists the features of the MW-520 vehicle mount.

“Safety Considerations”, describes the safety guidelines that should be observed when installing the MW-520.

“Installation”, describes the tools and equipment, planning requirements, and product inspections necessary for a smooth installation of the MW-520.

Safe Handling Instructions

FCC Compliance Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a different circuit from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notational Conventions

Throughout this publication, you will notice the use of warnings, cautions, and notes. These notations are used to emphasize that safety hazards exist, and care must be taken.

Do not proceed beyond a WARNING or CAUTION until the indicated conditions are fully understood and met.

Warning

Warning

Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

Caution

Caution

Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. CAUTION may also be used to alert against unsafe practices and property-damage-only accident hazards.

Note

Note

An operational procedure, practice, condition, etc., which it is essential to emphasize.

Safety Considerations

Important information on safe and efficient operation. Read this information before using your radio product.

The information provided in this document supersedes the general safety information contained in user guides published prior to July 2000. For information regarding radio use in a hazardous atmosphere please refer to the Factory Mutual (FM) Approval Manual Supplement or Instruction Card, which is included with radio models that offer this capability.

RF Operational Characteristics

Your radio product contains a transmitter and a receiver. When it is ON, it receives and transmits radio frequency (RF) energy. The radio product operates in the frequency range of 806 MHz to 870 MHz and employs analog and/or digital modulation techniques.

When you communicate with your radio product, the system handling your call may control the power level at which your radio product transmits. The output power level typically may vary over a range from 0.00024 watts to 0.7 watts.

Exposure to Radio Frequency Energy

Your Motorola radio product is designed to comply with the following national and international standards and guidelines regarding exposure of human beings to radio frequency electromagnetic energy:

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR part 2 sub-part J.
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95. 1-1992.
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition.
- National Council on Radiation Protection and Measurements (NCRP) of the United States, Report 86, 1986.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998.
- Ministry of Health (Canada) Safety Code 6. Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz, 1999.
- Australian Communications Authority Radiocommunications (Electromagnetic Radiation - Human Exposure) Standard 1999 (applicable to wireless phones only).

To assure optimal radio product performance and make sure human exposure to radio frequency electromagnetic energy is within the guidelines set forth in the above standards, always adhere to the following procedures:

Electromagnetic Interference/Compatibility

Note

Nearly every electronic device is susceptible to electromagnetic interference (EMI) if inadequately shielded, designed or otherwise configured for electromagnetic compatibility.

Facilities

To avoid electromagnetic interference and/or compatibility conflicts, turn off your radio product in any facility where posted notices instruct you to do so. Hospitals or health care facilities may be using equipment that is sensitive to external RF energy.

Aircraft

When instructed to do so, turn off your radio product when on board an aircraft. Any use of a radio product must be in accordance with applicable regulations per airline crew instructions.

Medical Devices

Pacemakers

The Health Industry Manufacturers Association recommends that a minimum separation of 6” (15 cm) be maintained between a handheld wireless radio product and a pacemaker. These recommendations are consistent with the independent research by, and recommendations of, US Food and Drug Administration.

Persons with pacemakers should:

- ALWAYS keep the radio product more than 6” (15 cm) from their pacemaker when the radio product is turned ON.
- Not carry the radio product in the breast pocket.
- Use the radio product away from the pacemaker to minimize the potential for interference.
- Turn the radio product OFF immediately if you have any reason to suspect that interference is taking place.

Hearing Aids

Some digital wireless radio products may interfere with some hearing aids. In the event of such interference, you may want to consult your hearing aid manufacturer to discuss alternatives.

Other Medical Devices

If you use any other personal medical device, consult the manufacturer of your device to determine if it is adequately shielded from RF energy. Your physician may be able to assist you in obtaining this information.

Safety and General

Use While Driving

Check the laws and regulations on the use of radio products in the area where you drive. Always obey them.

When using your radio product while driving, please:

- Give full attention to driving and to the road.
- Use hands-free operation, if available.
- Pull off the road and park before making or answering a call if driving conditions so require.

Vehicles with Air Bags

Do not place a portable radio product in the area over an air bag or in the air bag deployment area. Air bags inflate with great force. If a portable radio is placed in the air bag deployment area and the air bag inflates, the radio product may be propelled with great force and cause serious injury to occupants of the vehicle.

Potentially Explosive Atmospheres

Turn off your radio product prior to entering any area with a potentially explosive atmosphere, unless it is a radio product type especially qualified for use in such areas as "Intrinsically Safe" (for example, Factory Mutual, CSA, or UL Approved). Do not remove, install, or charge batteries in such areas. Sparks in a potentially explosive atmosphere can cause an explosion or fire resulting in bodily injury or even death.

The areas with potentially explosive atmospheres referred to above include fueling areas such as below decks on boats, fuel or chemical transfer or storage facilities, areas where the air contains chemicals or particles, such as grain, dust or metal powders, and any other area where you would normally be advised to turn off your vehicle engine. Areas with potentially explosive atmospheres are often but not always posted.

Blasting Caps and Areas

To avoid possible interference with blasting operations, turn off your radio product when you are near electrical blasting caps, in a blasting area, or in areas posted: "Turn off two-way radio". Obey all signs and instructions.

Operational Cautions

Antennas

Do not use any radio product that has a damaged antenna. If a damaged antenna comes into contact with your skin, a minor burn can result.

Batteries

All batteries can cause property damage and/or bodily injury such as burns if a conductive material such as jewelry, keys, or beaded chains touch exposed terminals. The conductive material may complete an electrical circuit (short circuit) and become quite hot. Exercise care in handling any charged battery, particularly when placing it inside a pocket, purse, or other container with metal objects.

Mobile Radio Operation and EME Exposure

To assure optimal radio performance and that human exposure to radio frequency electromagnetic energy is within the guidelines referenced earlier in this document, transmit only when people outside the vehicle are at least the minimum distance away from a properly installed, externally-mounted antenna.

The table below lists the minimum distance for several different ranges of rated radio power.

Rated Power of Vehicle-installed Mobile Two-way Radio	Minimum Lateral Distance from Transmitting Antenna
Less than 7 watts	8” (20 cm)
7 to 15 watts	1 foot (30 cm)
16 to 50 watts	2 feet (60 cm)
More than 50 watts	3 feet (90 cm)

Antenna Installation

Mobile Antennas

Recommended mobile antenna installations are limited to metal body vehicles at the center of the roof and center of the trunk deck locations.

The antenna installation must additionally be in accordance with:

- The requirements of the antenna manufacturer/supplier.
- Instructions in the Radio Installation Manual.

Fixed Site Antennas

Mobile radio equipment is sometimes installed at a fixed location and operated as a control station or as a fixed unit. In such cases the antenna installation must comply with the following requirements in order to assure optimal performance and make sure human exposure to radio frequency electromagnetic energy is within the guidelines set forth in the above standards:

- The antenna must be mounted outside the building.
- Mount the antenna on a tower if at all possible.
- If the antenna is to be mounted on a building then it must be mounted on the roof.
- As with all fixed site antenna installations, it is the responsibility of the licensee to manage the site in accordance with applicable regulatory requirements and may require additional compliance actions such as site survey measurements, signage, and site access restrictions in order to insure that exposure limits are not exceeded.

Introduction

The Mobile Workstation 520™ combines the power of a desktop computer with the flexibility required in a mobile environment. Its powerful processor can handle applications with local databases and detailed graphical images, including fingerprints, mugshots, and maps.

The integrated radio-modem provides access to your data system without the need for a separate, external radio-modem.

The workstation can be easily mounted even in dual airbag-equipped vehicles, to permit safe and comfortable user operation. The backlit display controls and uplit keyboard provide increased visibility and the removable keyboard offers improved usability.

Mount Features

The MW-520 mount:

- Holds the MW-520 display within easy view of the driver.
- Permits easy access to the dashboard controls.
- Permits easy access to and removal of the keyboard.
- Enables easy access or, if preferred, prevents access with flexible placement of the CPU.

Mount General Description

The RLN4687 MW-520 Mount Assembly is comprised of four major components: the pedestal assembly, the keyboard assembly, the CPU arm, and the display assembly. All four assemblies are shipped as a complete unit with a hardware bag for mounting to the customer's vehicle hump.

The pedestal assembly is mounted to a 7 1/2" plate, extends approximately 10" high and terminates in a double clevis that accepts the display assembly. The pedestal assembly can be rotated 120 degrees and is friction adjustable. Additionally, the pedestal assembly has a 6" horizontal extension pedestal attached at the lower end of the vertical assembly, to accommodate the simple attachment of the keyboard assembly and CPU arm.

The keyboard assembly allows for the quick insertion and removal of the MW-520 keyboard. The keyboard platform swivels left and right freely, with friction adjustment available. The keyboard platform can also be tilted and locked in the required position by loosening a knob on the underside of the platform. The keyboard is removed by pressing up on the spring loaded flange under the keyboard platform. The keyboard is installed by placing the back of the keyboard against the locating flanges on the back vertical wall of the platform and pressing down the front so that the spring flange engages the detente on the front of the keyboard.

The CPU arm allows for mounting of the CPU box on the pedestal. As shown in Figure 4 and Figure 5, the CPU arm can protrude forward or backward from the pedestal. The CPU box can be mounted on the CPU arm using the supplied trunnion (Figure 6 and Figure 7), or in any other suitable location.

The display assembly is designed to attach the MW-520 display directly using the provided hardware in the display kit (not SDI supplied). The display can be swiveled a total of 90 degrees, ±45 degrees in each direction. Two options are available for the display tilt limit: 10 degrees or 45 degrees. The 45 degree option allows 45 degrees backward tilt towards the dashboard and 77 degrees forward tilt. The 10 degree option limits the backward tilt to 10 degrees. The 10 degree limiting cam can be removed to allow a 45 degree tilt (see Figure 27). The swivel is friction adjustable by tightening the 10-32 nylok nuts under the display perch. The handle at the top left of the display is used to bring the display down. Grabbing the display on both sides and twisting it slightly allows the rotation of swivel to occur.

Installation

This section describes the tools and equipment, planning requirements, and product inspections necessary for a smooth installation of the Mobile Workstation 520™ (MW-520). Proper planning will help to ensure that the installation is completed without difficulty and that no damage occurs to the units or the vehicle.

Caution

The MW-520 is a reliable product when installed correctly. However, performance can be seriously impaired if it is not installed correctly. Thoughtful planning can make the difference.

Unpacking

Carefully unpack each item from the shipping carton. Check all items for shipping damage, and make sure you have received all items ordered.

If there is damage or missing items, retain the shipping carton for inspection.

The following parts are used to mount the CPU:

- Mount assembly RLN4687
- Trunnion for the MW-520 CPU HLN5488
- *Mobile Workstation 520 Vehicle Installation Guide,* 68P02962C15-O

Note

The foam cover, Motorola part no. 7586540F01, is placed on the protruding Power connector to protect it from incidental hits. Keep the connector covered until the CPU is secured in its place.

Use this cover whenever the CPU is disassembled.

Preparing to Install the MW-520 Inside the Vehicle

Tools

The following tools and service aids are required for installation:

- 3/8” nut driver
- 1/2”, 3/8” or 7/16” wrench
- No. 2 Phillips screwdriver
- Drill with 3/16” drill bit

Planning

Be sure to consider the following issues when planning the installation:

- Keyboard and display location relative to air bag deployment zones
- Environmental considerations

- Electrical guidelines
- LP gas warning
- Usability by driver/operator

MW-520 Mounting Location

The MW-520 is typically installed on a pedestal (included in the kit) which affixes directly to the vehicle transmission hump or to the hump plate (preferred and not included in the kit).

Using an optional tall pedestal under the MW-520 is recommended only for use in vehicles where air bag compliance is not required. An example of this is a utility van which does not currently have passenger-side air bags in the given model year.

Correct positioning of the pedestal will ensure that the MW-520 meets the following requirements:

- There is proper equipment ventilation.
- It is within easy reach of the driver/operator (more difficult due to air bag constraints).
- It will not injure the operator or passenger in case of an accident.
- It does not interfere with the operator's driving vision.

Provided for your reference are several air bag deployment zone templates from automobiles used in public safety roles (Figures 1-3). Please obtain the official documents for the automobile in which you are installing the MW-520 to ensure the safety of the operator.

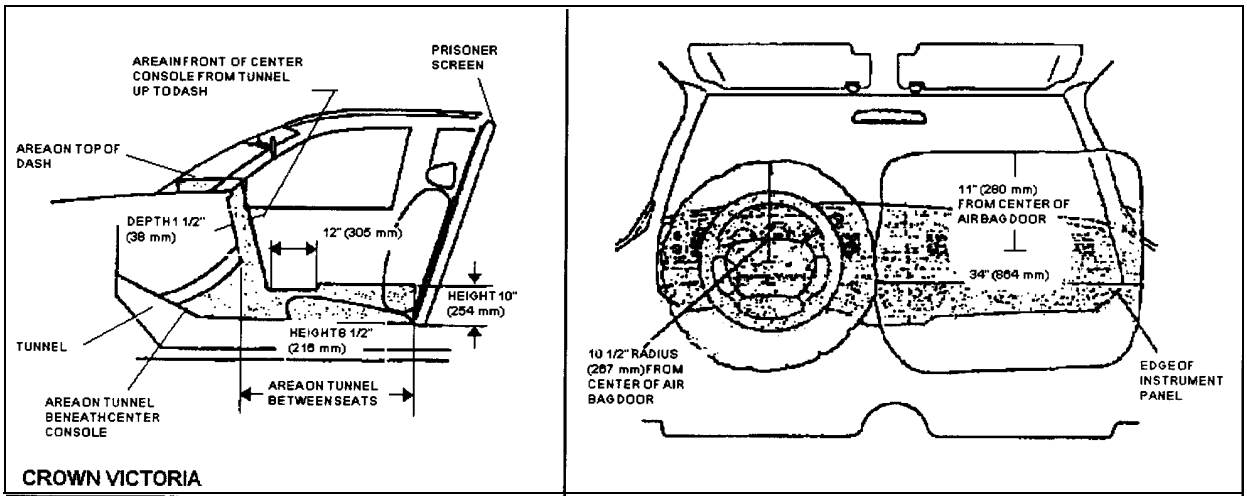

AREA IN FRONT OF CENTER CONSOLE FROM TUNNEL UP TO DASH
PRISONER SCREEN
AREA ON TOP OF DASH
DEPTH 1 1/2" (38 mm)
12" (305 mm)
HEIGHT 10" (254 mm)
HEIGHT 8 1/2" (216 mm)
TUNNEL
AREA ON TUNNEL BENEATH CENTER CONSOLE
AREA ON TUNNEL BETWEEN SEATS
CROWN VICTORIA
11" (280 mm) FROM CENTER OF AIR BAG DOOR
34" (864 mm)
10 1/2" RADIUS (267 mm) FROM CENTER OF AIR BAG DOOR
EDGE OF INSTRUMENT PANEL

Figure 1
Air Bag Deployment Zones - Crown Victoria

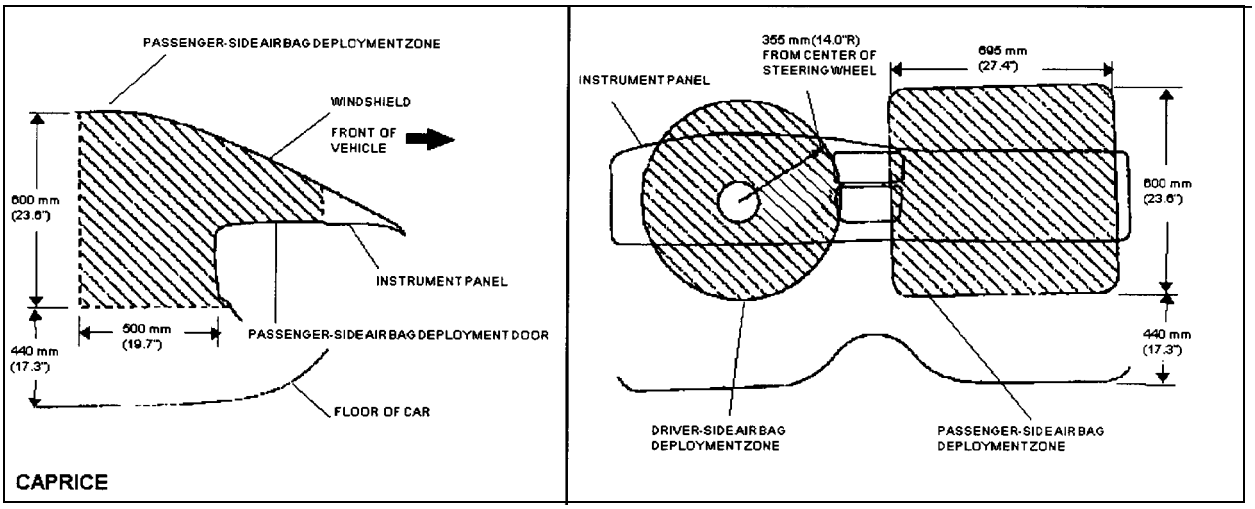


Figure 2
Air Bag Deployment Zones - Caprice

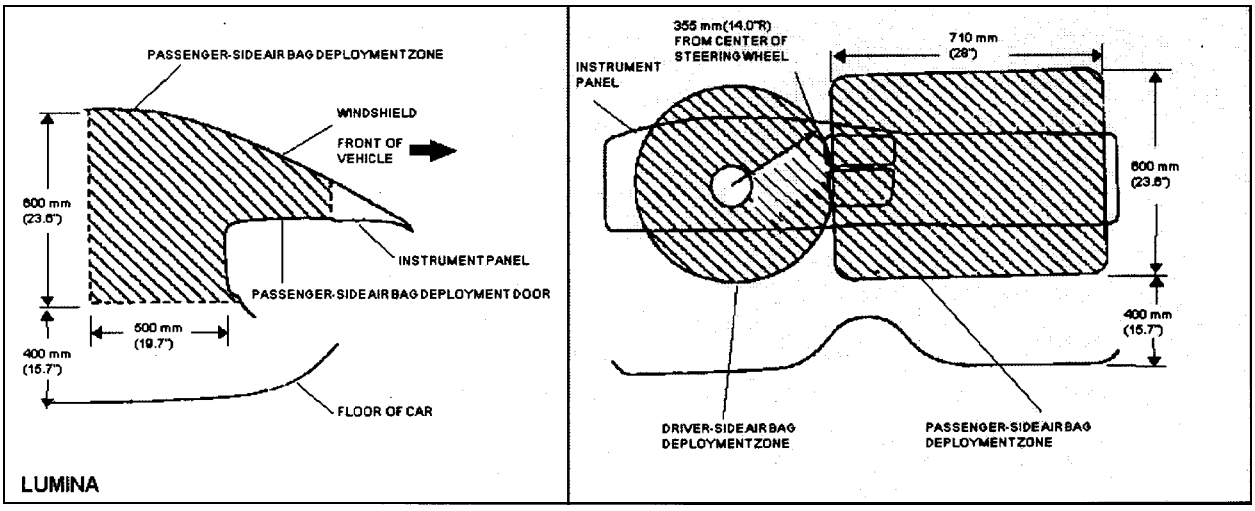


Figure 3
Air Bag Deployment Zones - Lumina

Environmental Considerations

Consider the environmental parameters listed in the *MW-520 Owner's Manual* before installing the MW-520.

For operation in hot climates, the vehicle must be adequately ventilated.

Electrical Guidelines

Be sure that the vehicle's electrical system is in good condition. Faults in the alternator and ignition system can be a source of severe Radio Frequency Interference (RFI) and can result in MW-520 operating problems. Correct any problems in the alternator output, ignition system, and battery condition before beginning the installation.

The minimum voltage requirement for operating the MW-520 is 11 to 16V DC, 8A. The vehicle must have an alternator that can produce a high-current output at low speed (below 18 m.p.h. or 29 km/h) and in an idle state. It also needs the highest rated heavy-duty battery available for the vehicle.

DO NOT install the workstation in a vehicle with a positive-ground electrical system.

Installation Procedure

Installation Time

A qualified and experienced service technician requires between one and three hours to install and configure the MW-520 in a vehicle.

Mounting the MW-520

Perform the following steps to install the MW-520:

Step 1. Determine the proper mounting location.

Step 2. Remove the hardware bag from the shipping container.

Step 3. Ensure that the pedestal is securely bolted together.

Step 4. The pedestal can be mounted directly on the vehicle transmission hump or on a hump plate secured rigidly to the vehicle transmission hump. (Commercial hump plates are available, such as the SDI 7200 system or equivalent.)

Figure 4
Mount General View (CPU arm at rear)

Figure 5
Mount General View (CPU arm at front)

Figure 6
MW-520 System on Pedestal (CPU at rear)

Figure 7
MW-520 System on Pedestal (CPU at front)

Step 5. Place the pedestal with the keyboard, the display mount and the CPU arm (if desired) in the vehicle and use it for marking the location of the base plate on the vehicle transmission hump or on the hump plate.

Step 6. At the optimum location, drill four 1/4” holes into the transmission hump or the hump plate in order to achieve proper functionality and use of the MW-520.

Be careful not to drill into the transmission. Some commercially available hump plates, such as the SDI 7200 system, may have the hole pattern already pre-drilled.

Step 7. Attach the pedestal to the desired anchor point on the transmission hump or on the hump plate, using studs and nuts, screws and nuts or self-tapping screws, as required.

Steps 8 and 9 are optional for adjusting the tilt tension.

Step 8. Remove the two end caps as shown in Figure 27.

Step 9. Fold down tension should be adjusted by tightening the two 5/16” nuts at the edges of the folding mechanism. This can also be done when the MW-520 display is installed in the vehicle.

Step 10. Attach the display to the mount and route the display cable down the pedestal. Ensure that the display cable has enough slack to move when the display is tilted down.

Step 11. Rotate the keyboard left and right to determine the range of swivel. Some hump plates are attached to the anchor points of the seats. These hump plates allow adjustment front to back, thus allowing for fine-tuning of the installation.

Step 12. Fold the display up and down to determine the available range for the given vehicle and application. When mounting the keyboard, care must be exercised to ensure sufficient space for proper installation of the device. This will restrict the amount of tilt/swivel available. The 10 degree display tilt limiting cam is supplied as standard; it must be removed to allow a 45 degree tilt of the display.

MW-520 Keyboard

The MW-520 keyboard is located between the seats of the vehicle. Position it to allow some tilt and swivel of the keyboard tray.

The keyboard tray is attached to the MW-520 mount with an extension arm. This arm may be removed if desired and the tilt/swivel modified until attached to the adjustable “U” brackets.

If required, the keyboard mounting can be placed elsewhere in the vehicle to allow for use of other installed equipment. Please ensure that all safety guidelines and air-bag deployment requirements are met.

The keyboard is provided with a quick release holder to allow operation of the keyboard when out of the holder. Care must be used to ensure ample space for extracting and reinserting the keyboard into the holder. Ensure that the cable is routed in a manner that allows the operator to remove the keyboard from the mounting tray and operate the keyboard in their lap.

MW-520 Display

The MW-520 display is attached to the display mount on top of the pedestal using a Phillips screwdriver and screws supplied in the display shipping carton. The cable from the CPU box is routed through the mount and connected to the back of the display. First, connect the power cable, then attach the display to its mount. Use caution when assembling the cable to the display to prevent damage to the display or the cable.

Note

For the SDI Mount only, the display cable may be secured to the display using the supplied bracket (kit FHN6144).

Note

For the high brightness display option, an additional power cable must be used to supply power to the display.

Cable Support Bracket Kit

Follow the instructions given below to assemble the display cable. The part numbers in brackets refer to the numbers in Figure 8. Steps required for only the SDI Mount are indicated as such.

Step 1. Join the support bracket (part no. 3) to the display (part no. 1) using two M3.5 (part no. 6) screws (for SDI Mount only).

Step 2. Join the connector of the display cable (part no. 2) to the display (part no. 1).

Step 3. Support the display cable with the clip (part no. 4) using two M3 screws (part no. 5) (for SDI Mount only).

Note

Torque all support bracket screws to 6”/Lbs.

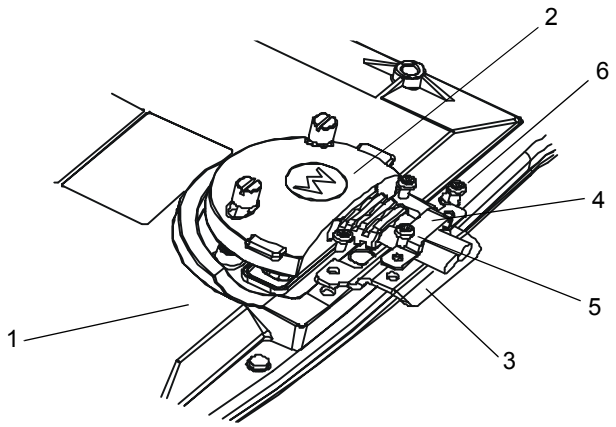


Figure 8
Display Cable Connector

Table 1
Parts Description

No.	Part No.	Description	Quantity
1	FLN2876B, FLN2877B, FLN2664B, FLN2672B, FLN2564B, FLN2542B, FLN2961A, FLN2928A, FLN2952A	Display	Ref.
2	30-02132C45	Cable	Ref.
3	07-086855T01	Support Bracket (for SDI Mount only)	1
4	07-86856T01	Clip Bracket (for SDI Mount only)	1
5	03-10903A12	Screw M3x0.5x8 mm (for SDI Mount only)	2
6	03-10903A92	Screw M3.5x0.5x10 mm Blk (for SDI Mount only)	2

Step 4. Separate the display cable along the center for a length of 80-100 mm (3-4”) from the display connector, as shown in Figure 9. Take care not to damage the wires within the cable.

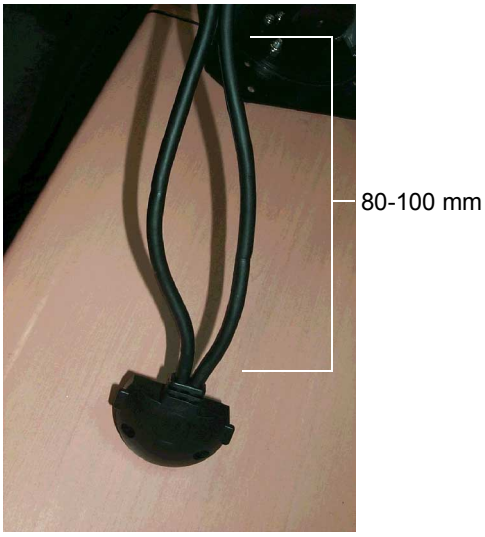


Figure 9
Display Cable Separated Along the Center

Step 5. Remove the two screws from the back of the display mounting plate (see Figures 10-13). The screws can be found either on the lower left-hand or right-hand side of the plate.

Step 6. Use the two screws (6-32 x ½) removed in Step 5 to attach the plastic tie anchors to the screw holes on either the left-hand or right-hand lower side of the plate (the location of the anchors depends on the cable routing). Use loctite 5331 on both screws.

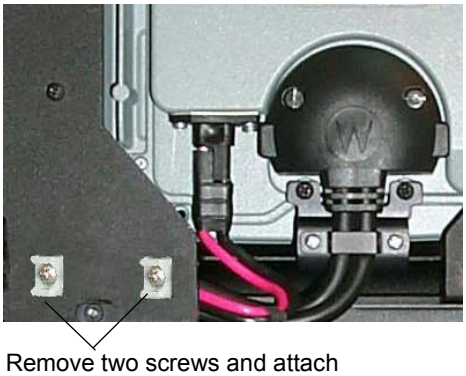


Figure 10
Attaching Tie Anchors for Cable Route (High Brightness SDI Mount)

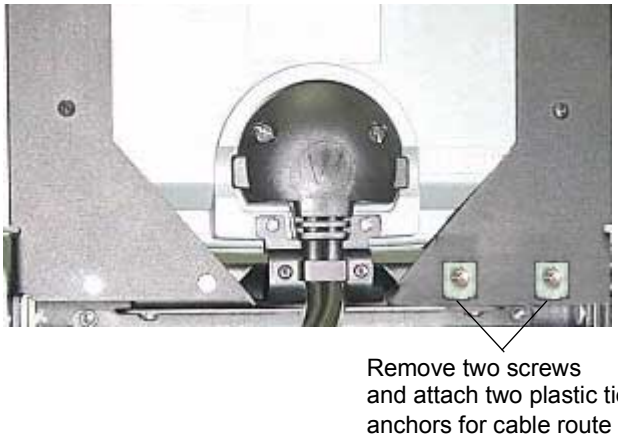


Figure 11
Attaching Tie Anchors for Cable Route (350 nit SDI Mount)

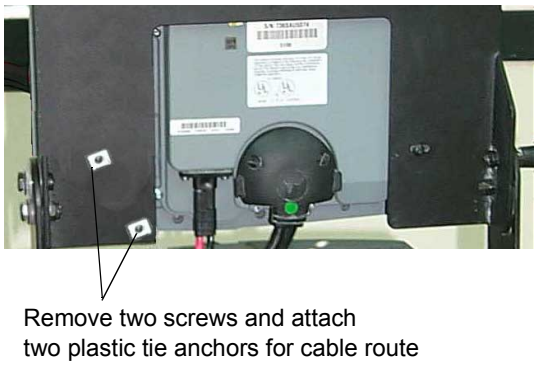


Figure 12
Attaching Tie Anchors for Cable Route (High Brightness Lund Mount)

Figure 13
Attaching Tie Anchors for Cable Route (350 nit Lund Mount)

Step 7. Using plastic ties, route the display cable along the bottom of the display mounting plate (see Figures 14-17). Make sure that the cable does not touch the mount or keyboard if the display is tilted or fully rotated.

Step 8. Use two additional cable ties to attach the display cable to the top and bottom of the pedestal stand.

Note
Make sure to leave an adequate service loop in the display cable so that it is not stressed when the display is tilted or rotated.

Note
When attaching the two ties, make sure the display cable is pointing downwards out of the connector hood, minimizing side pull and stress of the cable clip.

Note

The display cable can be routed on the left-hand or right-hand side of the pedestal, at the customer's discretion. For routing on the right or left side of the pedestal, adjust the directions in steps 5-8 accordingly.

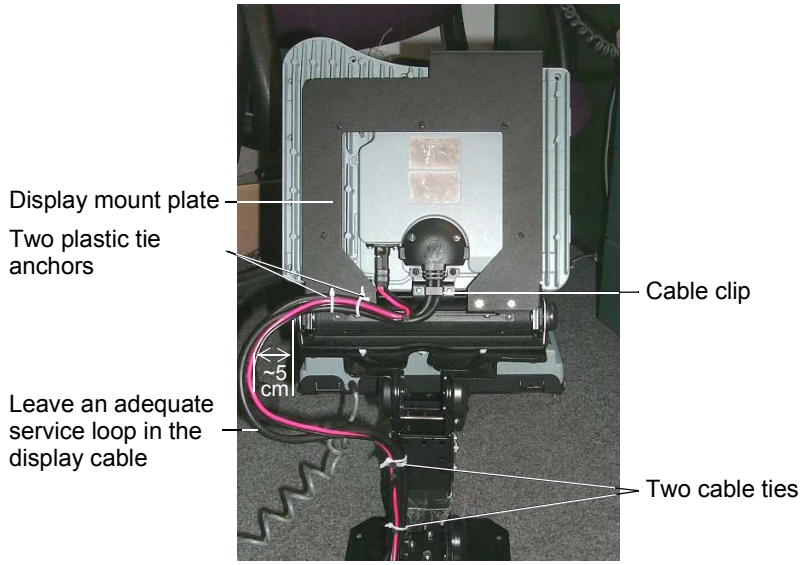


Figure 14
Display Cable Route (High Brightness SDI Mount)

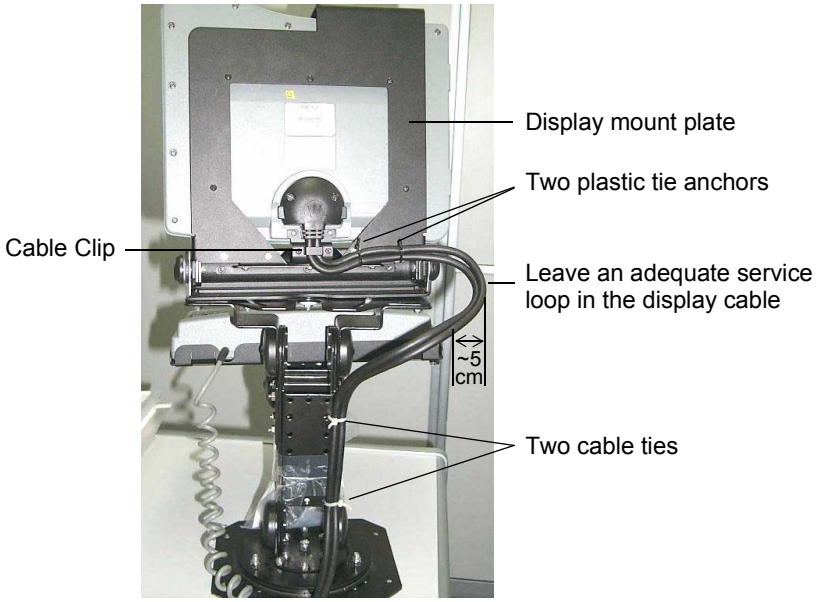


Figure 15
Display Cable Route (350 nit SDI Mount)

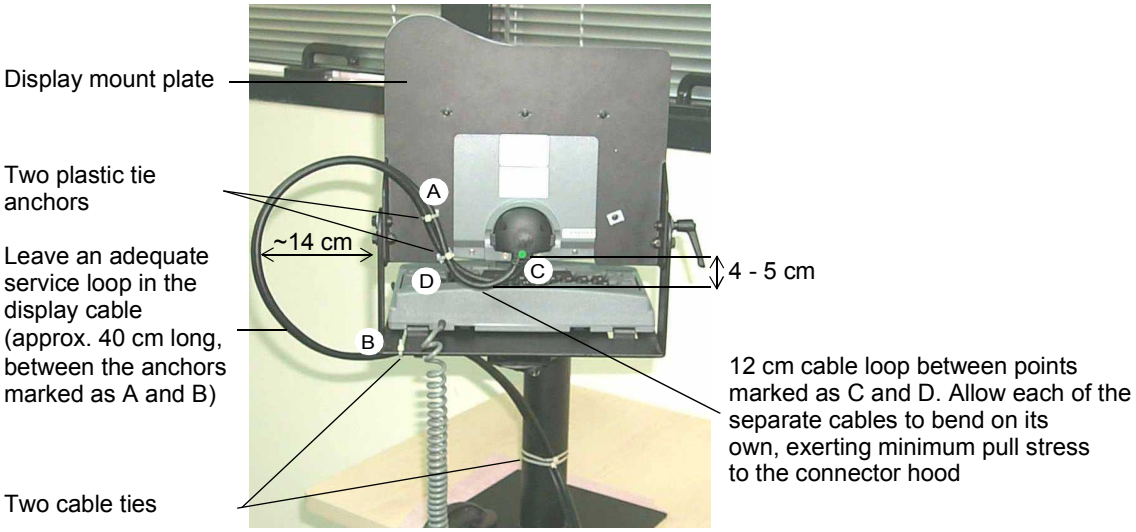

Display mount plate
Two plastic tie anchors
Leave an adequate service loop in the display cable (approx. 40 cm long, between the anchors marked as A and B)
Two cable ties
A
B
C
D
~14 cm
4 - 5 cm
12 cm cable loop between points marked as C and D. Allow each of the separate cables to bend on its own, exerting minimum pull stress to the connector hood

Figure 16
Display Cable Route (350 nit Lund Mount)

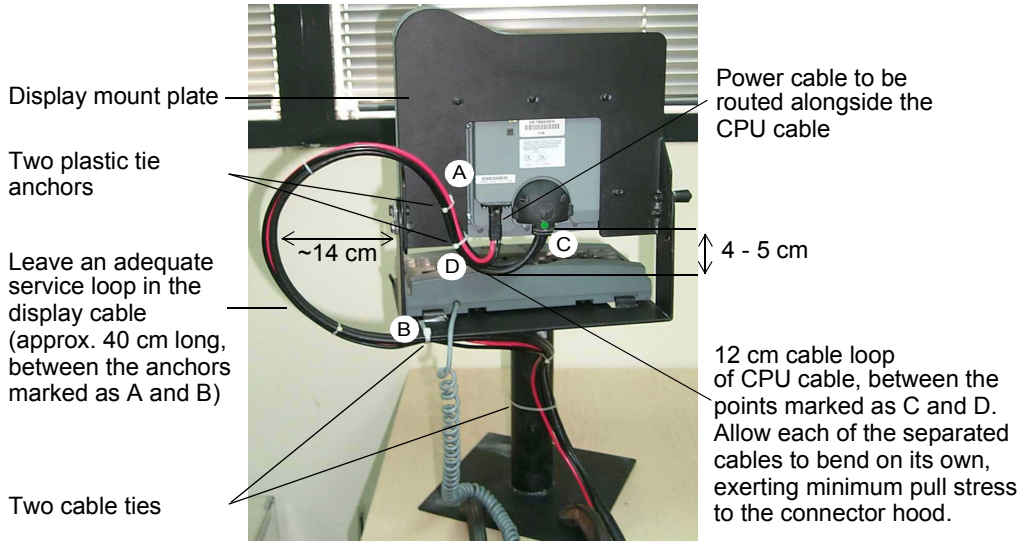

Display mount plate
Two plastic tie anchors
Leave an adequate service loop in the display cable (approx. 40 cm long, between the anchors marked as A and B)
Two cable ties
Power cable to be routed alongside the CPU cable
A
B
C
D
~14 cm
4 - 5 cm
12 cm cable loop of CPU cable, between the points marked as C and D. Allow each of the separated cables to bend on its own, exerting minimum pull stress to the connector hood.

Figure 17
Display Cable Route (High Brightness Lund Mount)

MW-520 CPU

The MW-520 CPU must be mounted so that the cables from the keyboard, display, power and options can be attached. The limiting factor is the 9.6 foot length of the display interface cable. When attached to the display, this cable is routed down through the pedestal to the CPU box. The CPU can be mounted anywhere in the passenger compartment of the vehicle that provides adequate ventilation.

It is recommended that the CPU unit be mounted in a place where the PC Card slots can be easily accessed. For the secured door option, consider that easy access should be assured when using the special tool for locking/unlocking the PC Card door.

In addition, attach the adhesive tapes provided in the shipping carton (Motorola part no. 556665F01) to the PC Cards to facilitate easy removal.

Suggested locations, in order of preference, are: on the pedestal's CPU arm, on the prisoner cage, under the dashboard, in the console, or under the seat (not in the direct path of the heater air flow).

If the CPU box is mounted on the pedestal, it must be mounted to the CPU arm using the trunnion. The CPU arm can be affixed to the pedestal in two possible orientations (see Figure 4 and Figure 5):

1. Directly under the keyboard tray (see Figure 5).
2. Using the same mounting holes as in option one, but protruding from the pedestal in the opposite direction to the keyboard tray (see Figure 4).

Note

The CPU box must be mounted so that it is within ±5 degrees of the primary axes, as illustrated in Figures 18-23.

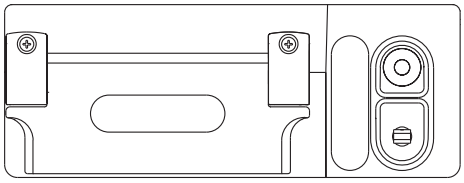


Figure 18
CPU front unit view

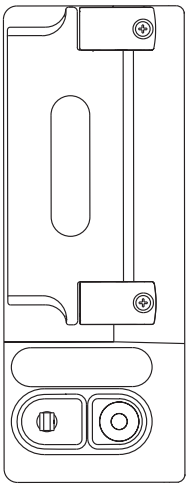


Figure 19
CPU unit front view - rotated 90 degrees

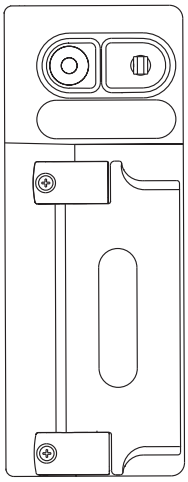
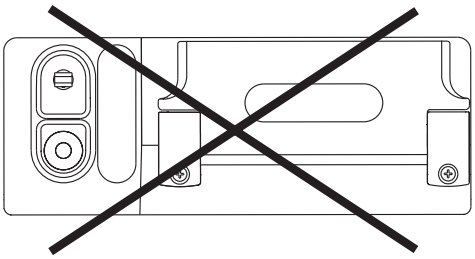
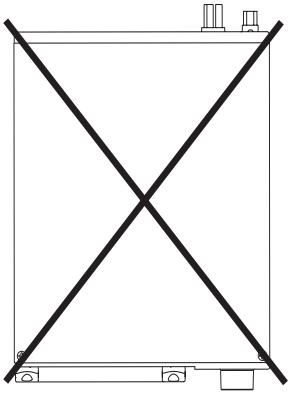


Figure 20
CPU unit front view - rotated 270 degrees



DO NOT MOUNT CPU BOX INVERTED

Figure 21
CPU unit front view - rotated 180 degrees



DO NOT MOUNT CPU IN THIS ORIENTATION

Figure 22
CPU unit side view

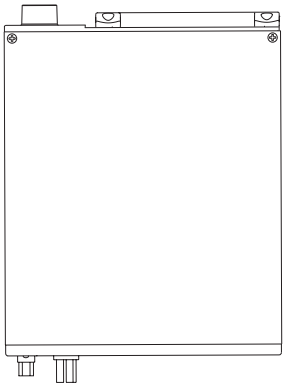


Figure 23
CPU unit side view - rotated 180 degrees

MW-520 GPS Antenna

To install the GPS antenna, perform the following steps:

Step 1. Drill a 12 mm hole into the mounting surface for the antenna post.

Step 2. Release the M18 nut and the flat washer from the antenna post and insert the post into the hole.

Step 3. Secure the post with the flat washer and the nut.

Interconnection of the MW-520

With the mechanical installation complete, hook up the optional antenna and other required options to the MW-520 CPU box.

Connect the DC cable at the end of the connection procedure.

RF Antenna Connection

If there is an internal radio and no Power Amplifier (PA), connect the vehicle antenna to the RF connector (mini UHF). If the optional RF PA is used, this connection is made to the RF-in connection on the RF PA and the vehicle antenna is connected to the antenna connector on the RF PA.

Parallel Port Connection

The MW-520 has one built in, PC-style DB-25 parallel port. You may use an off-the-shelf shielded parallel printer cable.

Keyboard Connection

Connect the keyboard to the bottom DB-9 female connector on the MW-520 CPU.

RS-232 Connection

There is one RS-232 port on the rear of the MW-520, an IBM® PC standard DB-9 male connector. To attach a radio modem, such as the VRM 600, use the FKN4369 cable or equivalent. To attach a Trimble Placer™ GPS 400, use the FKN4369 or FKN4367 cable or equivalent.

Ensure that the cables are properly routed to prevent damage to the cables and any operator hazards due to loose cables from the vehicle.

DC Connection for Standard Color Display (Options V672AA, V693AA, V676AB, V577AC)

The MW-520 comes with a Motorola DC cable (FKN4567) and fuse.

Step 1. Route the power cable from the power connector on the MW-520 CPU box to the vehicle battery using accepted industry methods and standards.

Step 2. Plug the cable tightly into the DC connector.

Step 3. Be sure to grommet the vehicle fire wall to protect the cable. Connect the red wire to the positive (+) terminal of the battery, and the black wire to the negative (-) terminal.

The black wire should be connected directly to the battery and not to the chassis of the vehicle.

DC Connection for High Brightness Color Display (Options V672AA, V693AA, V676AB, V577AC)

The MW-520 comes with two Motorola DC cables (FKN4567) and fuse.

Step 1. Route one power cable from the power connector on the MW-520 CPU box to the vehicle battery using accepted industry methods and standards.

Step 2. Plug the cable tightly into the DC connector of the CPU.

Step 3. Route the second power cable from the power connector on the display to the vehicle battery.

Step 4. Plug the cable tightly into the DC connector of the display.

Step 5. Be sure to grommet the vehicle fire wall to protect the cable. Connect the red wire to the positive (+) terminal of the battery, and the black wire to the negative (-) terminal.

Caution The black wire should be connected directly to the battery and not to the chassis of the vehicle.

Ignition-Sense Connection

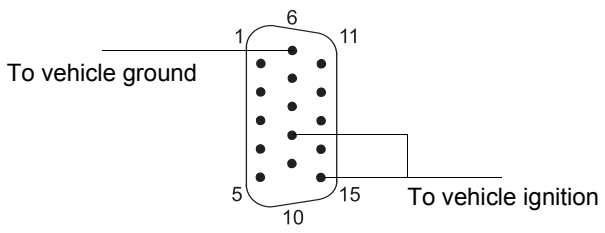
Note Whenever the MW-520 is not connected to the vehicle ignition, it is recommended to leave the AUX connector cover (Motorola part no. 3802219C10) in place.

To install the ignition-sense cable between the processor AUX connector and the vehicle ignition line, carry out the following steps:

Step 1. Connect a jumper wire to pins 9 and 15 of the AUX connector.

Step 2. Connect one end of the ignition-sense cable to pins 9 and 15 of the AUX connector, and the other end to the vehicle ignition.

Step 3. Connect pin 6 to the vehicle ground.



Pin #	Pin Name	Function
1 to 5	Reserved	
6	AGND	Ground
7-8	Reserved	
9	IGN_HIGH	Ignition
10-14	Reserved	
15	IGN_LOW	Ignition

Figure 24
AUX Port Pinouts

GPS Antenna Connection

The MW-520 comes with a GPS cable. Connect the GPS cable to the GPS connector on the CPU rear panel on one side and to the GPS antenna connector on the other side.

USB Connection

The MW-520 comes with one standard USB Type A receptacle connector to which any standard USB device can be connected.

Video In Connection

The MW-520 comes with a BNC Type connector to which a camera can be connected. A BNC to RCA adapter 5802810C07 is also available from Motorola, if required.

Audio In Connection

The MW-520 comes with an Audio In connector to which an external microphone can be connected.

Audio Out Connection

The MW-520 comes with an Audio Out connector to which external speakers can be connected.

Turning on the MW-520

The MW-520 main power switch must be flipped up to turn on main power. The soft power switch on the display is used for normal power cycle operations. Refer to the *Mobile Workstation 520™ Owner's Manual* for operating instructions.

Replacing the Fuse (Vehicle Power)

Remove the fuse (15 A) from the fuse holder located on the Motorola DC cable (FKN4711) and replace it with a new one of the same type and value (part no. 6580283E06).

Appendix: MW-520 Mount Assembly

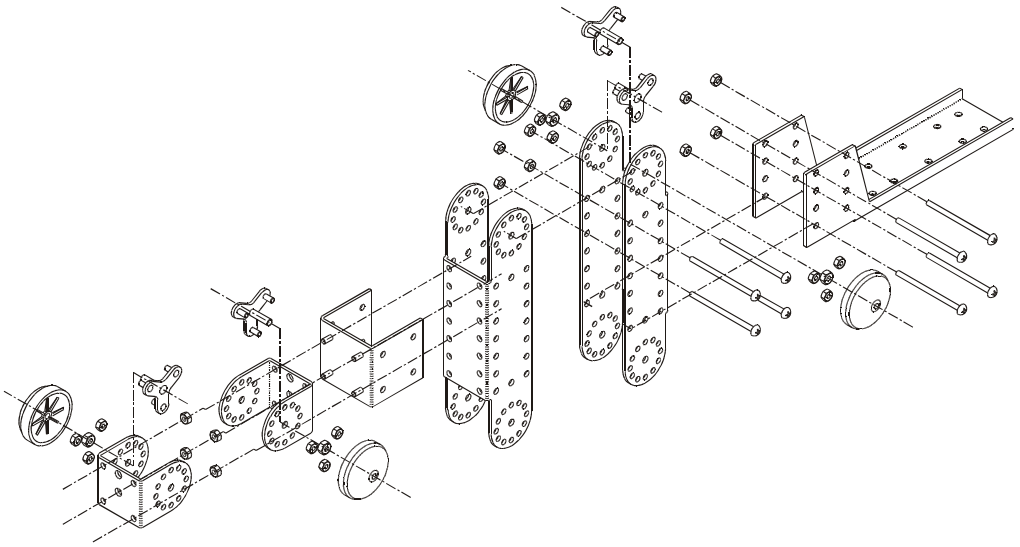


Figure 25
Pedestal Assembly - Exploded View
(CPU arm at rear)

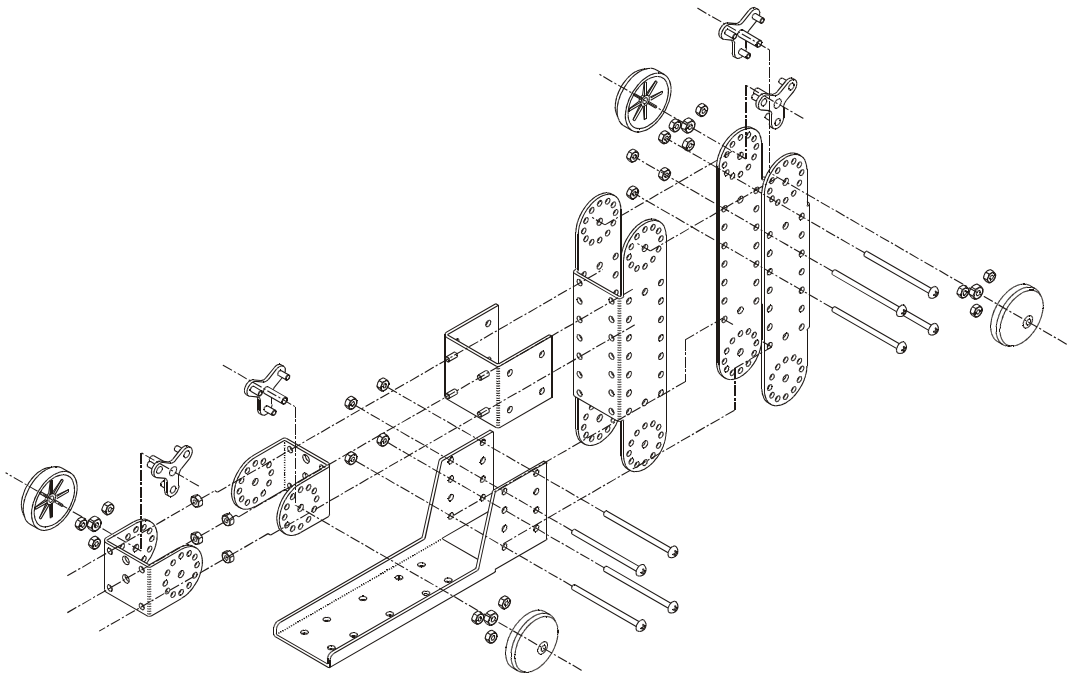


Figure 26
Pedestal Assembly - Exploded View
(CPU arm at front)

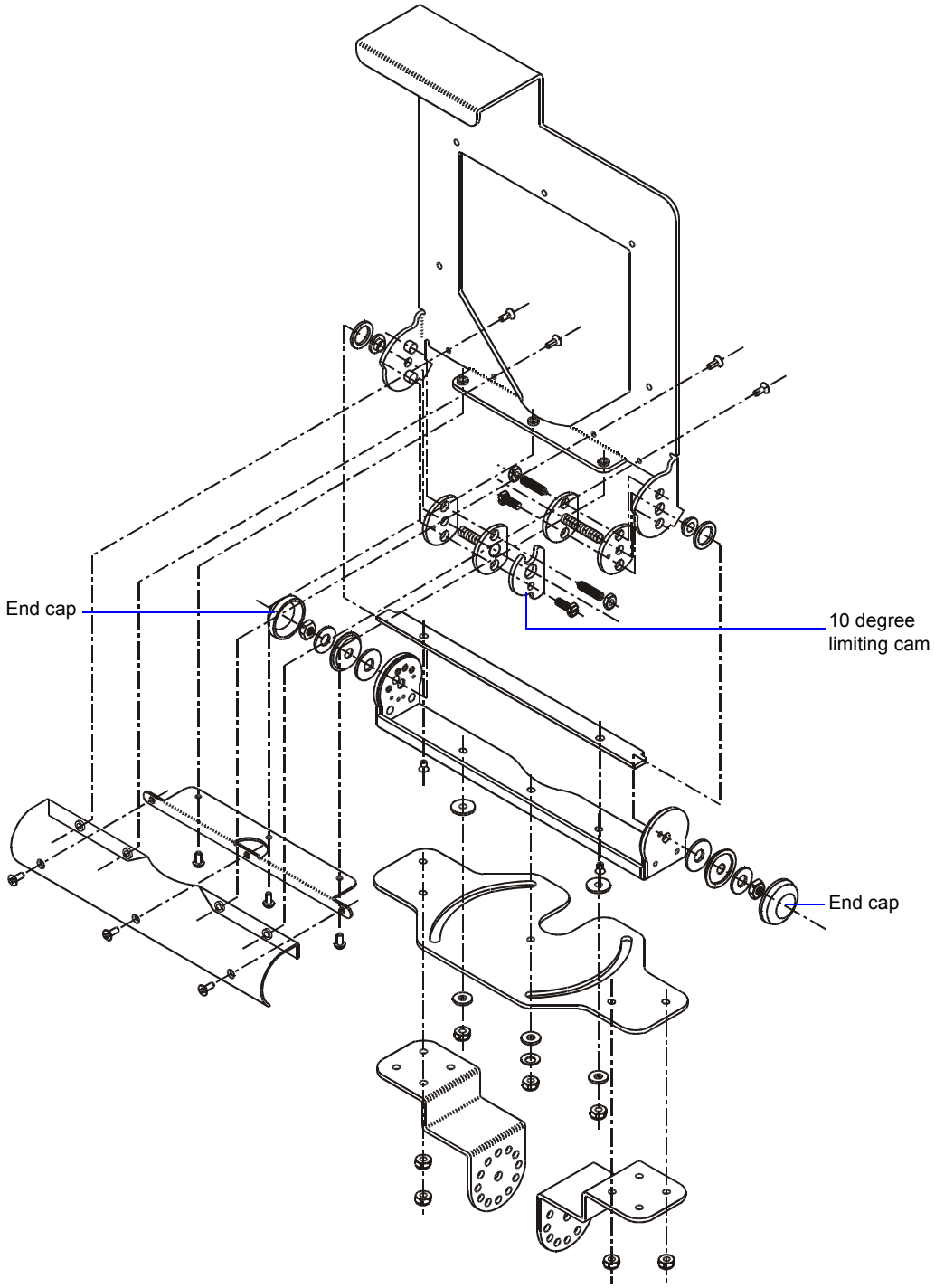


Figure 27
Display Assembly - Exploded View

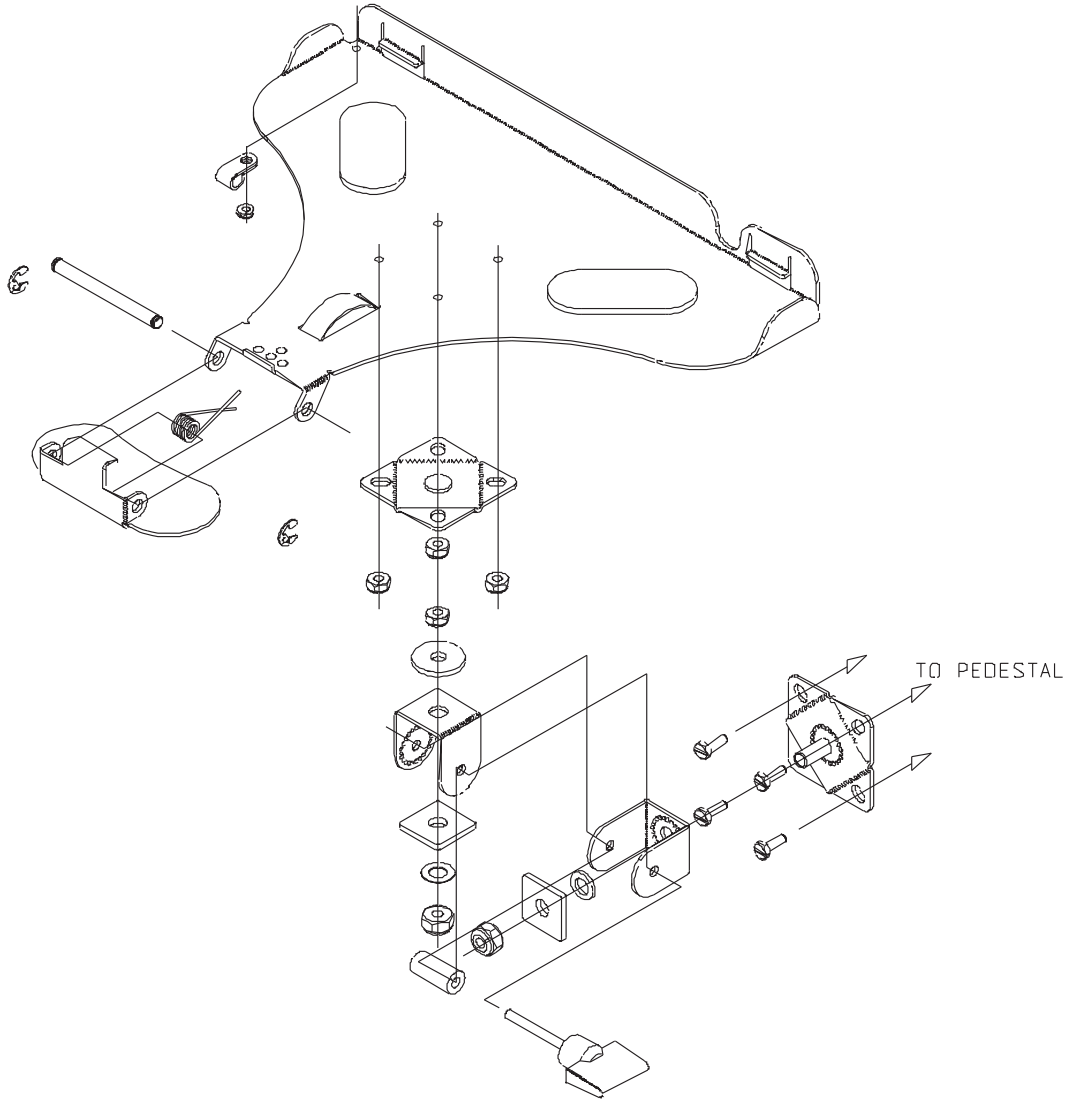


Figure 28
Keyboard Assembly - Exploded View

Acronyms

A	Amperes
ACK	Positive (Acknowledgment)
CPU	Central Processing Unit
DC	Direct Current
DTE	Data Terminal Equipment
GPS	Global Positioning System
LP	Liquid Propane
MDT	Mobile Data Terminal
NFPA	National Fire Protection Association
PA	Power Amplifier
PC	Personal Computer
RF	Radio Frequency
RFI	Radio Frequency Interference
UHF	Ultra High Frequency
UL	Underwriter’s Laboratories
V	Volt
VRM	Vehicular Radio Modem

Glossary

C

Central Processing Unit (CPU): The computer in charge of fetching, processing, and storing data, generally used to refer to the entire microprocessor chip.

D

Data Terminal Equipment (DTE): User terminal equipment which creates information for transmission, for example, a user's PC.

DB-25: A 25-pin connector used for V.24 or RS-232C interfaces.

DB-9: A standard 9-pin connector used for serial interfaces.

Direct Current (DC): Current that flows through a circuit in only one direction.

G

Global Positioning System (GPS): A constellation of 24 radio navigation (not communication) satellites in six different orbits, which transmit signals used by GPS receivers to determine precise location (position, velocity, and time) solutions.

M

Mobile Data Terminal (MDT): Vehicle installed device providing a data entry and display user interface for data communication functions.

P

Personal Computer (PC): The generic term for a single user, microprocessor based computer whose architecture is derived from the original IBM® Personal Computer.

R

Radio Frequency (RF): Refers to the electromagnetic energy wavelengths between the audio and the light range (usually somewhere between 10 kHz and 300 GHz).

Radio Frequency Interference (RFI): 1) The Radio Frequency (RF) radiation which leaks from a device when it is transmitting. 2) Electrical disruption (noise) created by certain types of equipment that may be radiated through air.

RS-232: The most common, standard interface used to connect Data Terminal Equipment (DTE) to modems. It uses a DB-25 connector, although the DB-9 version has become popular on PCs which have limited space for connectors.

T

Trunnion: A pin pivot usually mounted on bearings for rotating or tilting an element.

U

Ultra High Frequency (UHF): Radio frequency, extending from 300 MHz to 600 MHz.

Underwriter's Laboratories (UL): An independent and non-profit USA testing/certification agency that was created by insurance companies to inspect electrical devices to ensure there are no shock or fire hazards present.

V

Vehicular Radio Modem (VRM): VRM 650 - External radio modem integrated with the MCS2000 mobile radio into a single unit for use with separate MDT.